CSCI 310: Software Engineering
Term: Fall 2024
Units: 4

Lecture: Monday, Wednesday—10:00am-11:50am
Location: THH 201

Instructor:

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Office: SAL 334
Office Hours: Mon, 12:00pm - 2:00pm

Teaching Assistants:

PhD students
Office Hours: Posted on Brightspace and Piazza

Course Description

Introduction to software engineering processes and the software development lifecycle, covering project planning, requirement analysis, architectural design, detailed design, implementation, validation and verification (V&V), and maintenance, through a combination of individual and team-based software development projects.

Learning Objectives

Students will gain a basic understanding of the processes, methods, and tools for professional software development, and learn how to use some of these methods and tools in practical settings. Major objectives include

1. Understanding the importance of requirements, to make sure the software does what customers want it to do
2. Understanding the basic object-oriented (OO) design principles, to make sure the software is flexible to change
3. Understanding the basic OO design patterns, to make sure the software is maintainable and reusable
4. Understanding the development processes, to work efficiently with customers and other developers

Prerequisites

CSCI 201 (Principles of Software Development)
CSCI 104 (Data Structures and Object Oriented Design)
CSCI 103 (Introduction to Programming)

Textbook and Supplementary Readings

Textbook:
- Software Engineering (10th Edition), Ian Sommerville, Pearson, 2015

Supplementary Reading:
- Head First Software Development, Pilone and Miles, O'Reilly, 2008 (optional)
- Head First Design Patterns, Freeman and Robson, O'Reilly, 2014 (optional)

Assignments and Examinations

Your final grade will be based on completion of quizzes, two examinations, an individual coding project, and a team-based software development project.

- **Quizzes**: Unannounced quizzes will be used to check class attendance, and to assess your understanding of the lecture materials (each quiz will focus only on the lecture materials of the day when the quiz is given).

- **Examination #1**: This exam will cover materials taught in the first half of the semester.

- **Examination #2**: This exam will cover materials taught in the second half of the semester, although students are expected to understand the topics covered by the first exam.

- **Project #1**: This individual coding project will a "warming-up exercise" for all students in the class to get familiar with **Android Studio** (which will to be used to complete the team-based Project 2). It will also develop your ability to use modern software development tools.

- **Project #2**: This team-based coding project will develop your ability to collaborate with other students and use the *iterative (agile) software development* process. The project consists of 5 tasks, resulting in 5 deliverables. The last task, called "sprint", is an "implementation" task that allows you to quickly improve the software that you've implemented in the first four tasks.

Grading Breakdown

Since you will learn most of the techniques **through lectures** and then practice a subset of them **through projects**, your final grade will be based on your performance in both **quizzes/examinations** (45%) and **projects** (55%).

Assignment	% of Grade
Quizzes	5%
Examination #1	20%
Examination #2	20%
Individual Coding Project (Project #1)	10%
Team Project (Project #2)	45%
Deliverable #1 - 5% (requirements) *Deliverable #2 - 5% (design)* *Deliverable #3 - 20% (implementation)* *Deliverable #4 - 10% (testing)* *Deliverable #5 - 5% (sprint)*	
TOTAL	**100%**

While the team project (Project #2) is a collaborative exercise, each student will receive an individualized grade based on (1) the team's overall performance and (2) the student's individual contribution; thus, an individual's grade may deviate from the team's grade, although (ideally) all team members are expected to contribute equally.

No students are allowed to miss either examinations. Failure to take an exam during its scheduled time will result in a grade of zero on that exam.

Without penalty, students are allowed to miss up to four (4) pop-up quizzes during the entire semester – missing four quizzes indicates that you've missed (at least) two weeks of lectures. The way we implement this "leniency" policy is to drop four (4) of your lowest-graded quizzes at the end of the semester, when we calculate your final grade.

If you have serious issues that need accommodation, please notify the instructor (examples include death of parents, being hospitalized, or going on a business trip for the university). However, if you have to miss a class (and therefore is worried of missing a pop-up quiz) due to minor issues (travel/illness/interview/etc.) there is NO need to notify us because the leniency policy of "dropping-four-lowest-graded-quizzes" is designed primarily to account for such issues.

Additional Policies

Late homework submissions will be accepted within 24 hours after the announced deadline, but with a penalty of 20%. Assignments more than 24 hours late will not be accepted, and will result in a grade of 0.

After grading is completed for an assignment, if you notice a grading error, please notify the TAs within one week. After one week (7 calendar days), requests for regrading will no longer be allowed.

Course Schedule *(tentative)*

Week	Date	Topic	Textbook *(Sommerville)*	Supplement *(Head First)*	Homework
1	08/26	Introduction	Ch.1-2		
	08/28	Android I			
2	09/02	NO CLASS – Labor Day Holiday			
	09/04	Android II			Project 1
3	09/09	Tools: version control and issue tracking	Ch. 25	Ch.6-8	
	09/11	Tools: build and unit testing			
4	09/16	Tools: test-driven development (TDD)			
	09/18	Iterative development I	Ch. 3-5	Ch. 1-5	
5	09/23	Iterative development II & Requirements			Project 2.1
	09/25	Iterative development III		Ch. 9-11	
6	09/30	Architectural design	Ch. 6		
	10/02	Detailed design	Ch. 7		Project 2.2
7	10/07	OO Design Principles			
	10/09	OO Design Patterns I			
8	10/14	Review for Exam 1			Project 2.3
	10/16	**Exam 1** – *at 10 -11:50AM*			
9	10/21	OO Design Patterns II			
	10/23	Testing I	Ch. 8		
10	10/28	Testing II			
	10/30	No lecture + Team Meeting for Project 2.3 (must attend)			
11	11/04	Testing III			
	11/06	No lecture + Team Meeting for Project 2.3 (must attend)			Project 2.4
12	11/11	NO CLASS – Veterans Day Holiday			
	11/13	No lecture + Team Meeting for Project 2.4 (must attend)			
13	11/18	Automated Testing (e.g., Fuzzing)			
	11/20	Program Analysis I			
14	11/25	Program Analysis II			Project 2.5
	11/27	NO CLASS – Thanksgiving Holiday			
15	12/02	No lecture + Team Meeting for Project 2.5 (must attend)			
	12/04	Wrap Up – Review for Exam 2			Project 2.5 due on 12/06
16	12/09	NO CLASS – Study Day			
	12/11	**Exam 2 –** *at 11:00AM-1:00PM* [*]			

[*] *The university offered two possible time slots and we chose the one on December 11 (instead of December 16).*

Statement on Academic Conduct and Support Systems

Academic Conduct
Office of Academic Integrity – (213) 764-4163
academicintegrity.usc.edu

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in The USC Student Handbook, in the section titled "Integrity and Accountability". Other forms of academic dishonesty are equally unacceptable. The course uses the MOSS tool to check for plagiarism. All incidents of plagiarism will be reported to the *Office of Academic Integrity*.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - 988 for both calls and text messages – 24/7 on call
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 740-0411
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.